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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/901,917	07/09/2001	Michael A. Walker	11675.101.1.1	8603

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EXAMINER

THOMAS, TONIAE M

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 03/28/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/901,917

Applicant(s)

WALKER ET AL.

Examiner

Toniae M Thomas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This action is a first Office action on the merits of Application 09/901,917.

Currently, claims 1-22 are pending.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. *Claims 1-2, 6, 9, 12-13, 15, 17, 19-20, and 22 are rejected under 35*

U.S.C. 102(b) as being anticipated by Lee et al. (US 5,343,354 B1).

Lee et al. disclose a process of forming a container cell (figs. 4A-4E and accompanying text). The method comprises the following steps: forming a trench 10 in a semiconductor substrate 100 (fig. 4A); forming an isolation film 101 within the trench (fig. 4A); forming a first gate stack upon the substrate (fig. 4B); forming a second gate stack upon the isolation film (fig. 4B); and etching a container cell into the isolation film (fig. 4C).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. *Claim 3, 8, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. in view of Wolf et al. (Vol. 2).*

Lee et al. do not teach that forming the trench comprises spinning on a photoresist, masking, exposing and patterning the photoresist to create a photoresist mask, and anisotropically etching through the photoresist mask .

Wolf et al. teach that it is well known in the art to form a trench by spinning on a photoresist, masking, exposing and patterning the photoresist to create a photoresist mask, and anisotropically etching through the photoresist mask (page 48, fig. 2-32). It would have been obvious to one of ordinary skill in the art to form the trench as claimed because the claimed method of forming a trench is well known in the art.

Lee et al. do not teach that any RIE etch process is used to etch the container cell.

Wolf et al. teach that it is well known in the art to form trench structures for storage capacitors using an RIE etch process (page 602). It would have been obvious to one of ordinary skill in the art to use an RIE etch process to form the cell container because, as Wolf et al. teach, forming cell containers using an RIE process is well known in the art.

4. *Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. in view of Wolf et al. (Vol. 3).*

Lee et al. do not teach the step of forming silicon nitride spacers on the first and second gate stacks.

Wolf et al. teach forming silicon nitride spacers on MOS transistor gates (page 635, fig. 9-62). One of ordinary skill in the art would have been motivated to modify Lee et al. by forming silicon nitride spacers on the first and second gate stacks, as taught by Wolf et al., because silicon nitride spacers enhance the gate fringing field effects (Wolf et al. - page 634, High Dielectric Spacers).

5. *Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. in view of Wolf et al. (Vol. 1).*

Lee et al. teach that the second polysilicon layer "PE" is formed using an in-situ doping CVD process (col. 7, lines 3-13). However, *Lee et al. do not teach* that the first polysilicon layer "SE" is formed using an in-situ doping CVD process.

Wolf et al. teach that it is well known in the art to form polysilicon using an in-situ doping CVD process (page 182, second paragraph). It would have been obvious to one of ordinary skill in the art to form the first polysilicon layer using an in-situ doping CVD process because, as Wolf et al. teach, forming polysilicon using an in-situ doping CVD process is well known in the art.

6. *Claims 4, 5, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. in view of Yieh et al. (US 6,114,216).*

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Lee et al. teach that the isolation film is BPSG. Lee et al. do not teach that the isolation film is TEOS or PSG film.

Yieh et al. disclose a method for forming an isolation trench (figs. 20A-20D). Yieh et al. teach the use of TEOS oxides and the use of PSG films as isolation films (col. 47, lines 3-11, 29-35). Yieh et al. also teach that TEOS oxides, PSG, and BSG are recognized in the art as equivalent materials for isolation films. Because TEOS oxides, PSG, and BPSG are recognized in the art as equivalent materials used for isolation films, one of ordinary skill in the art would have been motivated to replace the BPSG of Lee et al. with either TEOS or PSG.

7. *Claims 14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al.*

Lee et al. do not teach that the edge and interface are not coplanar. However, matters relating to ornamentation only which have no mechanical function cannot be relied upon to patentably distinguish the claimed invention from the prior art (see *In re Seid*, 161 F.2d 229, 73 USPQ 431 (CCPA 1947)). Therefore, the limitation of the edge and interface not being coplanar is taken to be an obvious variation of the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M Thomas whose telephone number is (703) 305-7646. The examiner can normally be reached on Monday through Thursday 8:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (703) 308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are (703)

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305-3432 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JMJ

March 25, 2002

Carl Whitehead, Jr.
CARL WHITEHEAD, JR.
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